

Contents

Foreword	i
1. Connection	1
2. Configure SMARTDAC+	2
3. Configure S7 PLC	4
4. Setting Sample.....	10

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Foreword

This document describes how to connect a SIEMENS PLC (S7-1200) to a GX10/GX20/GP10/GP20 Paperless Recorder (hereafter referred to as the GX/GP) and a GM Data Acquisition System (hereafter referred to as the GM).

For more details, please see the General Specifications (GS 04L53B51-01EN) or the PROFINET Communication User's Manual (IM 04L51B01-22EN).

■ Applicable products

GX10, GX20, GP10, and GP20 Paperless Recorders (release number R5 or later) or Data Acquisition System GM (release number R5 or later) and GX90NW Network Module (PROFINET communication).

■ Precautions

- The contents of this manual may change without notice due to performance and functional improvements.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA representative as listed on the back cover of this manual.
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1. Connection

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1. Connect <S7 PLC to SMARTDAC+ with GX90NW>

■ Configuration



	Model Name	Manufacture	Setting Software
PROFINET Master	S7-1200 *1	SIEMENS	TIA-Portal *2
PROFINET Slave	SMARTDAC+ (GX/GP/GM)	YOKOGAWA	Web Application

*1 The model of PLC used in this project is CPU1211C.

*2 The version of the software used in this project is V15.1

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2. Configure SMARTDAC+

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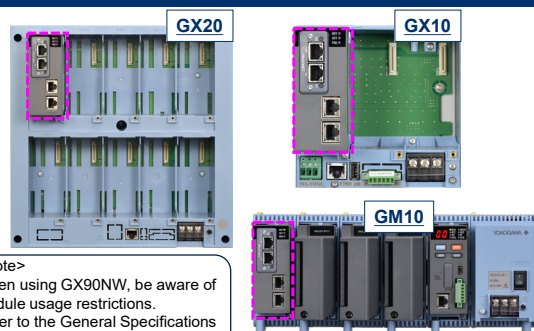


2. Configure SMARTDAC+

■ GX90NW Module Mounting Position

◆ GX90NW must be mounted in the following position

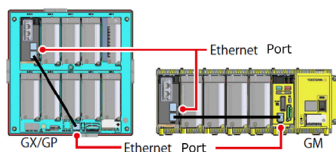
- GX10/GP20 : SLOT 9
- GX10/GP10 : SLOT 2
- GM System : Leftmost position when facing the front of the main unit.



<Note>
When using GX90NW, be aware of module usage restrictions. Refer to the General Specifications (GS 04L53B01-01EN).

■ Connection

◆ Connect the Ethernet port of SMARTDAC+ and the Ethernet port of the GX90NW



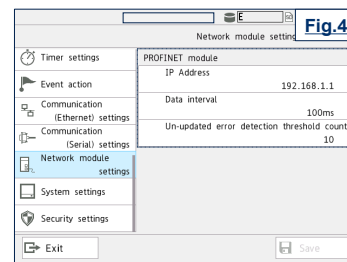
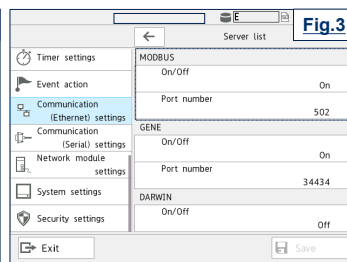
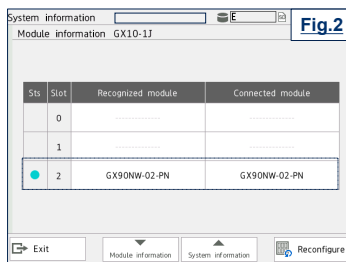
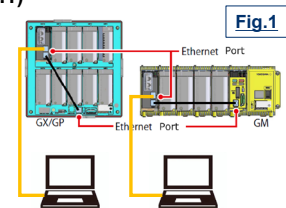
<Note>
Ethernet cable to use
• Shield twisted pair (STP)
• CAT5 or higher

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2. Configure SMARTDAC+

■ Main unit setting

- ◆ Connect the Ethernet port of SMARTDAC+ and a PC with an Ethernet cable (Fig.1)
- ◆ Reconfiguration (Fig.2)
- ◆ Modbus Server "ON" (Fig.3)
- ◆ GX90NW Setting (Fig.4)
 - IP Address
 - Data Interval
 - Un-updated error detection threshold count
- ◆ The LED on the PROFINET port of GX90NW turns green (Fig.5)

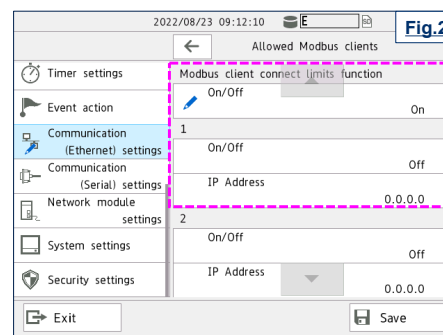
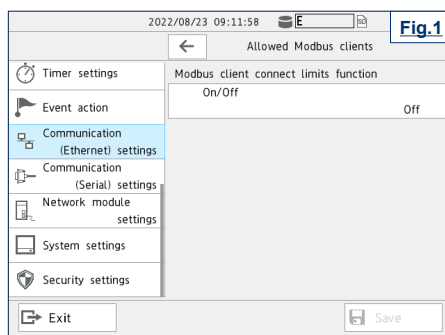


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2. Configure SMARTDAC+ - Note -

■ Modbus client connect limits function

- ◆ When using the GX90NW, pay attention to the Modbus client settings.
 - Turn on the Modbus client connection limits function. (Fig.1)
 - Alternatively, when turning it ON, please register the IP address of GX90NW. (Fig.2)



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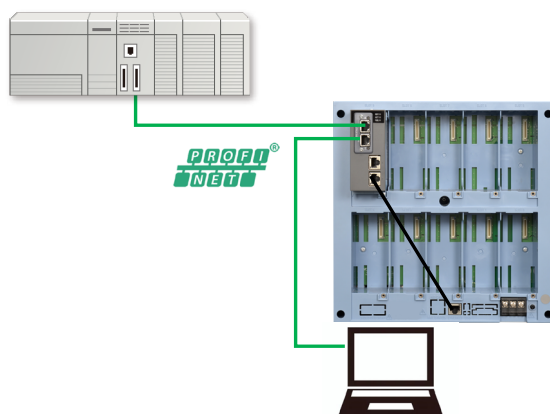
3. Configure S7 PLC

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3. Configure S7 PLC <Connection>

■ Connection

- ◆ Connect SMARTDAC+, S7 and PC with TIA Portal installed to the network



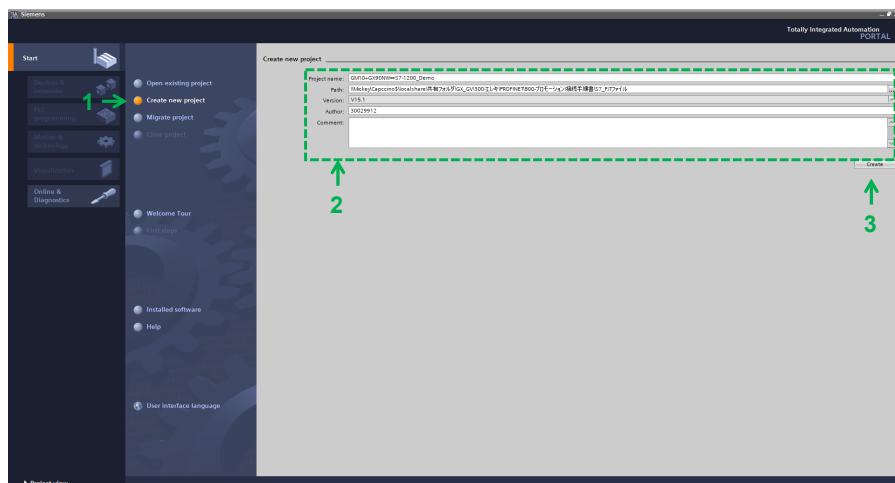
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3. Configure S7 PLC <Initial settings>

1. Click "Create new project"
2. Input Project name etc.
3. Click "Create"



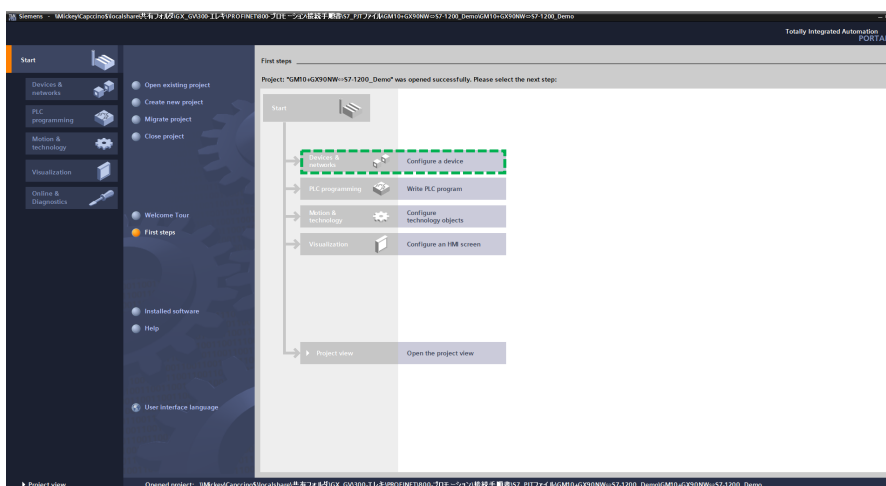
<Note>
TIA-Portal license is required.



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3. Configure S7 PLC <Initial settings>

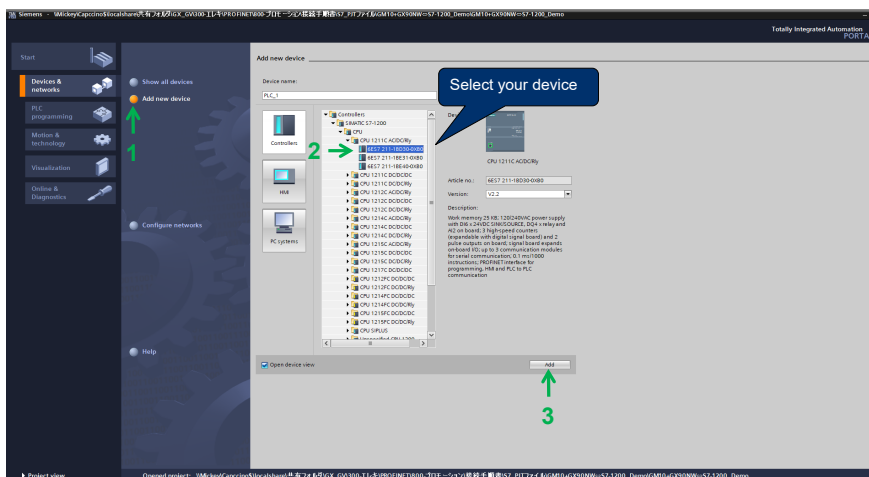
1. Click "Configure a device"



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3. Configure S7 PLC <Initial settings>

1. Click "Add new device"
2. Select your device.
3. Click "Add"

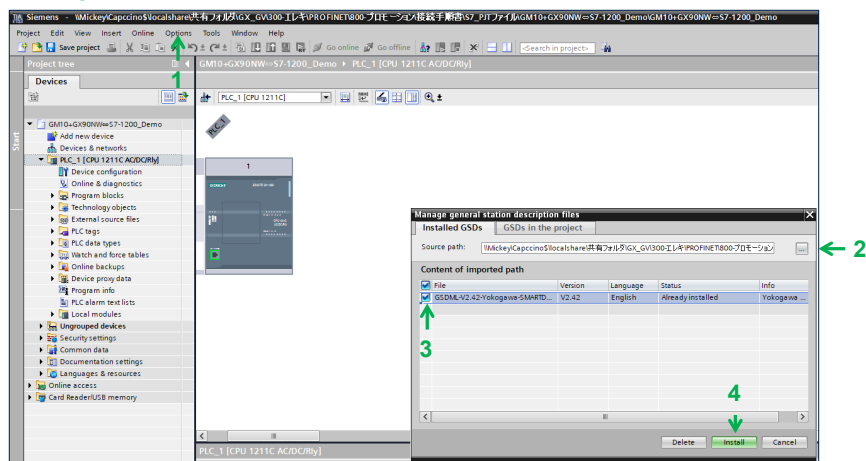


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3. Configure S7 PLC <Loaded GSDML file>

1. Select "Options" -> "Manage general station description files(GSD)"
2. Select source path of GSDML file for SMARTDAC+
3. Select GSD file for SMARTDAC+ which can be downloaded here
4. Click "Install"

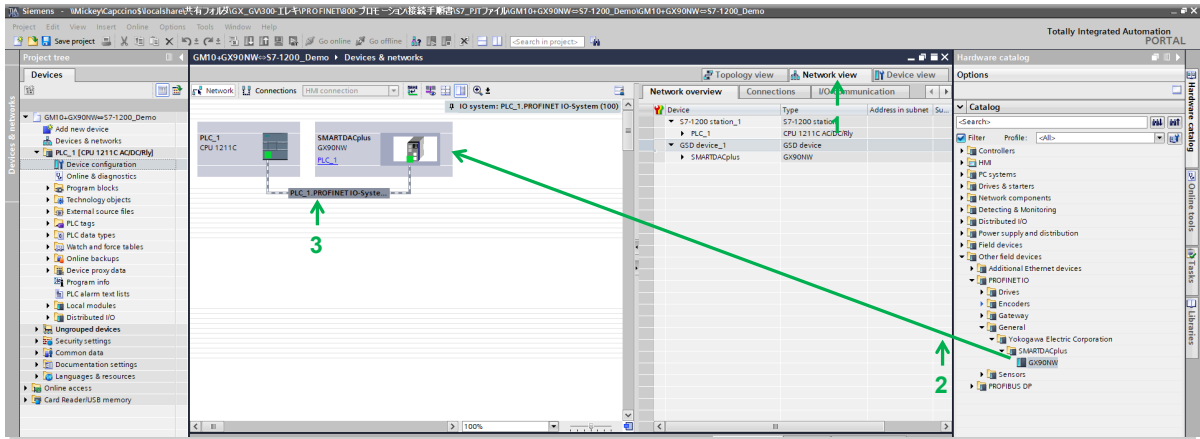
<Note>
Refer to the User's Manual
(IM 04L51B01-22EN) for the
download location of GSDML.



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3. Configure S7 PLC <Configuring Network>

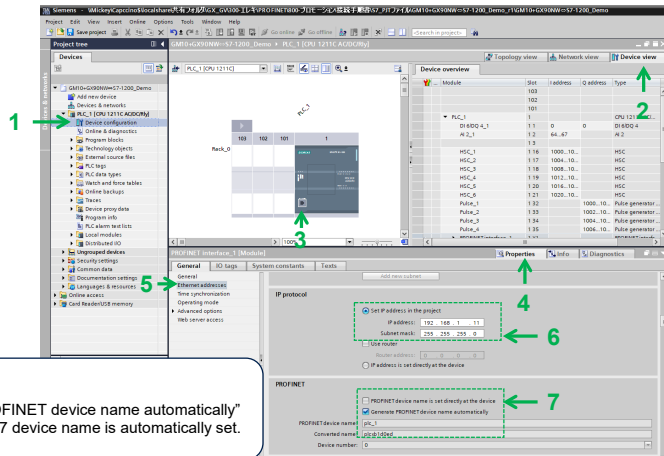
1. Click "Network view"
2. Click-hold on "GX90NW" and drag and drop it on Network view
3. Draw a line between PROFINET ports of S7 and GX90NW



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3. Configure S7 PLC <PLC IP Address/Subnet Mask>

1. Click "Device configuration"
2. Click "Device view"
3. Click Ethernet port
4. Click "Properties"
5. Click "Ethernet addresses"
6. Input IP address/Subnet mask
7. Input device name

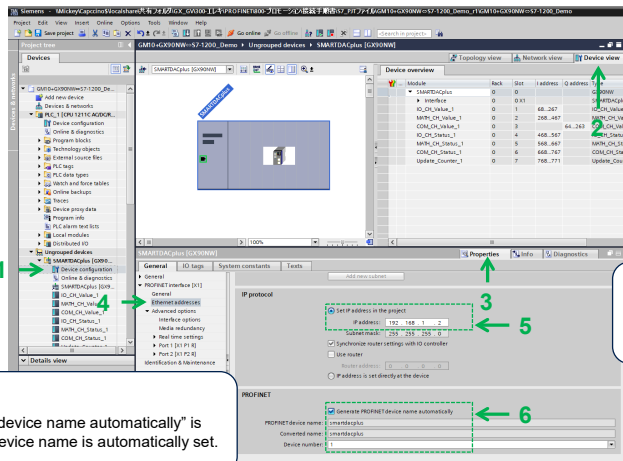


<Note>
If "Generate PROFINET device name automatically" is checked, the S7 device name is automatically set.

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3. Configure S7 PLC <GX90NW IP Address/Device Name>

1. Click "Device configuration"
2. Click "Device view"
3. Click "Properties"
4. Click "Ethernet addresses"
5. Input IP address
6. Input device name

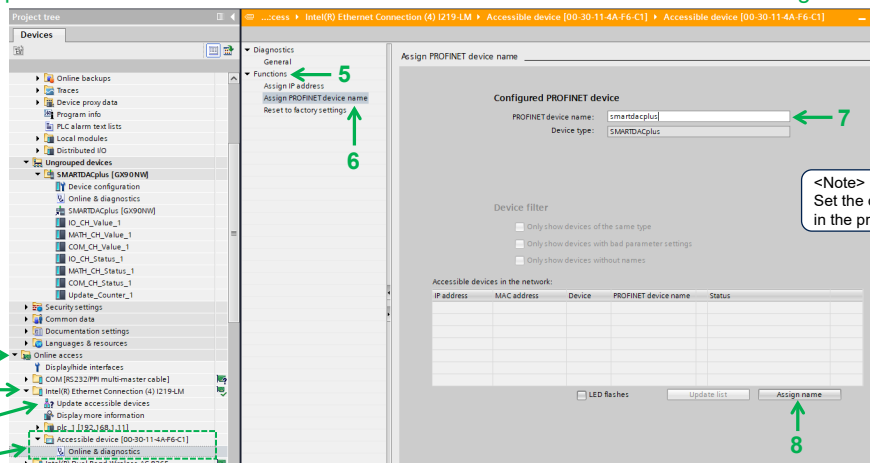


<Note>
If "Generate PROFINET device name automatically" is checked, the GX90NW device name is automatically set.

<Note>
IP address is automatically set. You can change it if you want.

3. Configure S7 PLC <GX90NW Assign Device Name>

1. Click "Online access"
2. Select port of PC
3. Click "Update accessible devices"
4. Select the device to set and click "Online & diagnostic"
5. Click "Functions"
6. Click "Assign PROFINET device name"
7. Assign device name
8. Click "Assign name"



<Note>
Set the device name configured in the previous procedure.

3. Configure S7 PLC <Download Setting to S7>

1. Click PLC
2. Click "Download to device"
3. Select port of PC
4. Click "Start search"
5. Select PLC
6. Click "Load"
7. Select Action if necessary
8. Click "Load"
9. Click "Finish"
10. Click "Go online"
11. Click "Start CPU"

The screenshot displays the Siemens TIA Portal interface. On the left, the Project tree shows the 'PLC_1' device selected. The main workspace shows the 'Extended download to device' dialog box with the 'Load' button highlighted. The 'Load preview' dialog box is also visible, showing the 'Load' button highlighted. Numbered arrows (1-11) indicate the sequence of steps for downloading settings to the S7 PLC.

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4. Setting Sample

4. Setting Sample

■ Setting Sample

- ◆ Read Data
 - Read analog Input 1-10ch(slot 0) of SMARTDAC+ to S7 PLC
- ◆ Write Data
 - Write analog Input 0-1ch of S7 to SMARTDAC+
- ◆ Start/Stop Recording
 - SMARTDAC+ record Start/Stop control from DI0 of S7
(DI0 Low→High : Rec Start, DI0 High→Low : Rec Stop)

4. Setting Sample <Tag Table>

1. Use "PLC tags"
2. Fill in the necessary information

Name	Tag table	Data type	Address
1	Rec_AI01	Rec_AI_ch01-10	%ID68
2	Rec_AI02	Rec_AI_ch01-10	%ID72
3	Rec_AI03	Rec_AI_ch01-10	%ID76
4	Rec_AI04	Rec_AI_ch01-10	%ID80
5	Rec_AI05	Rec_AI_ch01-10	%ID84
6	Rec_AI06	Rec_AI_ch01-10	%ID88
7	Rec_AI07	Rec_AI_ch01-10	%ID92
8	Rec_AI08	Rec_AI_ch01-10	%ID96
9	Rec_AI09	Rec_AI_ch01-10	%ID100
10	Rec_AI10	Rec_AI_ch01-10	%ID104
11	PLC_AI_ch00	PLC_AI_ch0-1	%IW64
12	PLC_AI_ch01	PLC_AI_ch0-1	%IW66
13	PLC_AI_ch00_out	PLC_AI_ch0-1	%QD64
14	PLC_AI_ch01_out	PLC_AI_ch0-1	%QD68
15	PLC_DI0	Bool	%M60
16	Req_Rec_Start	Rec_Start_Stop	%M50.0
17	Req_Rec_Stop	Rec_Start_Stop	%M51.0
18	Rec_Start	Rec_Start_Stop	%M60
19	Rec_Stop	Rec_Start_Stop	%M61

<Note>
For the cycle data of SMARTDAC+, refer to User's Manual (IM 04L51B01-22EN).

Operand identifier:
I : input
Q : output
M : memory

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22

4. Configure S7 PLC <Write PLC Value to SMARTDAC+ comm Ch.>

1. Use "Program blocks"
2. Programming, used by "MOVE" function

Write the analog input value (%IW64, %IW66) of the PLC to the SMARTDAC+ communication channel(%QD64, %QD68)

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4. Configure S7 PLC <Start/Stop Recording>

1. Use "Program blocks"
2. Programing, used by "MOVE" and "WRREC" function

IF DI0 is "ON", MW60 address will be written "1". It means starting record of SMARTDAC+.

IF DI0 is "OFF", MW61 address will be written "2". It means stopping record of SMARTDAC+.

If DI0 goes from 0 to 1 (OFF→ON), send the signal only once.

If DI0 goes from 1 to 0 (ON→OFF), send the signal only once.

INDEX	Data	Direction	サイズ (byte)	Data Type	配列	Supplementary Information
301	Starts or stops recording (when multi batch is not in use)	Read/Write	2	INT16	0	0: Fixed at 0 when reading 1: Start recording 2: Stop recording

* IM04L51B01-22EN

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4. Configure S7 PLC <Check real-time operation and values>

1. Click "Monitor all"
2. You can check real-time operation and values

<Note>
PLC must be connected online.

	Name	Tag table	Data type	Address	Retain	Acces...	Writ...	Visibl...	Monitor value
1	Rec_A101	Rec_al_ch01-10	Dint	%ID68					9999
2	Rec_A102	Rec_al_ch01-10	Dint	%ID72					9999
3	Rec_A103	Rec_al_ch01-10	Dint	%ID76					9999
4	Rec_A104	Rec_al_ch01-10	Dint	%ID80					9999
5	Rec_A105	Rec_al_ch01-10	Dint	%ID84					9999
6	Rec_A106	Rec_al_ch01-10	Dint	%ID88					9999
7	Rec_A107	Rec_al_ch01-10	Dint	%ID92					9999
8	Rec_A108	Rec_al_ch01-10	Dint	%ID96					9999
9	Rec_A109	Rec_al_ch01-10	Dint	%ID100					9999
10	Rec_A110	Rec_al_ch01-10	Dint	%ID104					9999
11	PLC_Al_ch00	PLC_al_ch0-1	Int	%IM64					2730
12	PLC_Al_ch01	PLC_al_ch0-1	Int	%IM66					2730
13	PLC_Al_ch00_out	PLC_al_ch0-1	Dint	%QD64					2730
14	PLC_Al_ch01_out	PLC_al_ch0-1	Dint	%QD68					2730
15	DI0	PLC_DI0	Bool	%I0.0					FALSE
16	Req_Rec_Start	Rec_Start_Stop	Bool	%MS0.0					FALSE
17	Req_Rec_Stop	Rec_Start_Stop	Bool	%MS1.0					FALSE
18	Rec_Start	Rec_Start_Stop	Word	%MW60					16#0000
19	Rec_Stop	Rec_Start_Stop	Word	%MW61					16#0002
20	~Add new~>								

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Revision Information

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